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Ceylonese Lizards of the Family Scincidae

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ABSTRACT: This paper treats of Ceylon scincoid lizards in the collections of the United States National Museum, together with those in the Edward H. Taylor-Hobart M. Smith Collection at Lawrence, Kansas.

In this paper the following species are described as new: *Mabuya floweri*, *Riopa singha*, *Sphenomorphus deignani*, *Sphenomorphus rufogulus*, and *Nessia deraniyagalai*. One species, *Mabuya madarászi* Méhely is removed from the synonymy of *Mabuya macularia* Blyth, and re-established.

All the known forms are listed and keys are given for the species of the various genera. Altogether six genera occur with the 25 species distributed as follows: *Mabuya*, 6 species; *Dasia*, 1; *Riopa*, 2; *Sphenomorphus*, 7; *Chalcidoseps*, 1; and *Nessia*, 8.

This is the second * of a series of studies on the herpetological fauna of Ceylon. The materials on which this study has been based are the Ceylonese specimens of the U. S. National Museum and those in the Edward H. Taylor-Hobart M. Smith collection at Lawrence, Kansas (EHT-HMS). In the first collection there are 367 specimens; in the latter, approximately 1,000.

The source of the material in the U. S. National Museum is varied. Certain specimens represent the result of exchanges with various European museums; some with the museum in Colombo, Ceylon. A considerable number are from the J. Hurter collection that likewise contained material from a variety of sources. Nearly one third of the collection is a recent lot collected by Dr. H. G. Deignan of the National Museum, in the Kandy and Matale Districts of the central highland region of Ceylon.

* Edward H. Taylor. Comments on Ceylonese Snakes of the Genus *Typhlops* with descriptions of new species. Univ. Kansas Sci. Bull., vol. 31, pt. 2, Nov. 1, 1947, pp. 283-298, figs. 1-3. (First study.)

The material in the EHT-HMS collection, with a few exceptions, is a recently collected lot obtained by me, chiefly from the region about Trincomalee, Ceylon, with a scattering of specimens from other localities on the island.

The present study deals with the lizard family Scincidae, which is very well represented by six genera and 25 species. Five of this lot are regarded as new, and one form, *Mabuya madarászi* Méhely, is removed from the synonymy of *Mabuya macularia* and re-established.

The following forms occur in Ceylon:

| | |
|---------------------------------------|-----------------------------------|
| * <i>Mabuya bibronii</i> | <i>Sphenomorphus taprobanense</i> |
| * <i>Mabuya macularia</i> | <i>Sphenomorphus fallax</i> |
| * <i>Mabuya beddomii</i> | <i>Sphenomorphus rufogulus</i> |
| <i>Mabuya floweri</i> | <i>Chalcidoseps thwaitesi</i> |
| * <i>Mabuya carinata</i> | <i>Nessia burtonii</i> |
| <i>Mabuya madarászi</i> | <i>Nessia didactyla</i> |
| * <i>Riopa punctata</i> | <i>Nessia monodactyla</i> |
| <i>Riopa singha</i> | <i>Nessia bipes</i> |
| <i>Dasia haliana</i> | <i>Nessia sarasinorum</i> |
| * <i>Sphenomorphus dussumieri</i> | <i>Nessia hikanala</i> |
| <i>Sphenomorphus megalops</i> | <i>Nessia layardi</i> |
| <i>Sphenomorphus deignani</i> | <i>Nessia deraniyagalai</i> |
| <i>Sphenomorphus striatopunctatus</i> | |

The faunas of Ceylon, as regards their relationship to those in nearby land masses, seem to be paradoxical at times. Thus in certain genera the relationship is close; in others there is no apparent relationship whatever. Thus *Mabuya* is represented by six species in Ceylon, four of which are regarded as identical with those in India; two are endemic, or at least have not yet been reported in mainland India. On the other hand, *Nessia* has eight species, none of which occurs in India. In this case the relationship seems to be with South Africa and Madagascar where the genus *Acontias* occupies the same niche and has undergone a somewhat similar evolution. Most, if not all, of its African and Madagascar species have lost the limbs, and the scales are more highly specialized. Boulenger (1887)† regarded *Acontias* and *Nessia* as belonging to a single genus. However, a more recent proposal has been made for their separation by Hewitt (1929)‡.

* Species marked with an asterisk represent forms also occurring in India.

† Cat. Lizards British Mus., vol. 3, 1887, p. 424.

‡ Ann. Transvaal Museum vol. 13, 1929, p. 8.

Essex (1928)¶ has suggested that *Acontias* and *Nessia* represent the same stock but that they are end products of two divergent streams from an unknown center. That this center is not in continental Asia seems obvious.

Chalcidoseps is a relict monotypic genus known only from Ceylon, and may represent a survivor from a group, similar to *Nessia*, that has undergone a similar evolution. There are other monotypic genera of the same sort scattered throughout the southeastern part of Asia and the Indo-Malayan Archipelago. They likewise seemingly represent survivors of former specialized series of species. *Barkudia* and *Sepsophis* in India are typical examples. I am convinced that *Lygosoma quadrupes* § represents a single remaining form of a similarly specialized group. I would consider *Ateuchosaurus* as a representative of another specialized group; *Ophioscincus* represents another series with three living forms.

The two species of *Riopa* are closely related (*singha*), or identical (*punctata*), with Indian species. *Dasia*, belonging to an arboreal group of skinks, seems to be related most closely to species that exist in the Indo-Malayan Archipelago and the western Pacific Islands. A south Indian form exists (*subcoerulea*), but the relationship of this species is with eastern Asiatic forms and not with the Ceylonese species, despite the fact that there is a very considerable hiatus in the distribution of the genus in central and eastern India, Burma and Siam.

Mabuya is a genus of wide distribution (South Asia, Indo-Malaya, Africa, Central America, South America and West Indies). It is ultraconservative and, like *Eumeces*, has developed no very highly specialized types, although there is a tendency to greater specialization (small size) in Florida and west México in the latter genus. In ultraconservative species, changes of lesser extent are perhaps of greater significance than in the more plastic groups.

¶ Studies in Reptilian Degeneration. Proc. Zool. Soc. London, (1927) 1928, pp. 879-945, text figs. and plate.

§ I cannot agree with Dr. Malcolm Smith, 1937, in considering *Lygosoma quadrupes* as one of a specializing or "degenerating" series that includes *Sphenomorphus* and perhaps other genera (see Rec. Indian Mus., vol. XXXIX, part III, 1937, pp. 213-234).

KEY TO THE GENERA OF SCINCIDAE IN CEYLON

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1. Palatine bones in contact or overlapping along medial palatal line..... | 2 |
| Palatine bones not in contact along medial palatal line..... | 6 |
| 2. Supranasals present | 3 |
| Supranasals absent | 5 |
| 3. Scales keeled with from 2 to 7 keels..... | 4 |
| Scales smooth; body somewhat elongated; limbs pentadactyl, but short; widely separated when adpressed; scales smooth; lower eyelid with a semitransparent disk | <i>Riopa</i> |
| 4. Pterygoid bones not in contact, the palatal notch extending forward to level of centers of eyes; limbs pentadactyl, well developed, distinctly overlapping when adpressed; no distinct transverse bands..... | <i>Mabuya</i> |
| Pterygoid bones in contact anteriorly, the palatal notch not reaching forward to level of centers of eyes. Limbs pentadactyl, failing to touch or barely overlapping when adpressed; color pattern of transverse bands..... | <i>Dasia</i> |
| 5. Limbs pentadactyl, meeting, overlapping or failing to meet when adpressed; lower eyelid scaly; frontoparietal single or double; scales smooth or at most, with slight suggestion of keels or striations..... | <i>Sphenomorphus</i> |
| Limbs not pentadactyl, greatly reduced or absent; body anguiform; the nostril in rostral | 6 |
| 6. Nostril in anterior part of rostral, connected to the posterior edge of scale by a groove; limbs variable, never tetradactyl..... | <i>Nessia</i> |
| Nostril near the posterior edge of rostral; limbs short, tetradactyl..... | <i>Chalcidoseps</i> |

GENUS MABUYA Rafinesque

Mabuya Rafinesque, Anal. Nat., 1815, p. 76 n.n.

Genotype.—*Lacertus mabouya* Lacépède (not *Scincus Sloanii* Daudin *vide* Malcolm Smith, Fauna of British India, Rept. Amph., vol. 2, Sauria, 1935, p. 257).

Six species are recognized as occurring in Ceylon.

KEY TO SPECIES OF MABUYA IN CEYLON

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 1. A transparent disc on lower eyelid..... | <i>bibronii</i> |
| No transparent disc, but several larger transparent scales on lower eyelid..... | 2 |
| 2. A postnasal | <i>macularia</i> |
| No postnasal | 3 |
| 3. Scales almost smooth or with three to five very feeble keels..... | <i>beddomii</i> |
| Scales not smooth, each bearing 3, 5, or 7 strong keels..... | 4 |
| 4. Scales tricarinate (or sometimes also with a small tubercle on outer edge of scale); dorsum with a paired series of black markings..... | <i>floweri</i> |
| Scales with five or seven keels (except very young which may have three); no paired series of black markings..... | 5 |
| 5. Larger; snout to vent, 125 mm.; adpressed hind limb to wrist or elbow..... | <i>carinata</i> |
| Smaller; snout to vent, 77 mm.; adpressed hind limb to axilla or farther.... | <i>madarászi</i> |

Mabuya bibronii (Gray)

Tiliqua bibronii Gray, Ann. Mag. Nat. Hist., vol. 2, Dec., 1838, p. 290 (type locality unknown).

Mabuya bibronii Haly, Report on the collection of Reptiles and Batrachia in the Colombo Museum; Colombo, 1891, p. 14 (Mullaittivu, Eastern Province); Annandale, Spolia Zeylanica, vol. 3, pt. 11, Jan., 1906, p. 190 (Ceylon); Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, pt. 2, 1931, p. 164; Hora, Rec. Indian Mus., vol. 29, pt. 1, p. 1, pl. 1, fig. 4 (comment on habitat).

Mabuya bibronii Smith, The Fauna of British India including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, pp. 260-261 (Chundikulam, Eastern Province).

No specimens of this species are at hand. Its known distribution in Ceylon seems to be on the eastern coast.

It may be distinguished from other known Ceylonese forms by the presence of a rounded, undivided, semitransparent disk in the lower eyelid; two pairs of nuchals; scales 5-to 7-keeled; a postnasal, and 28-30 scale rows. The snout to vent length is 50 mm. It has been reported only from Eastern Province.

Mabuia macularia (Blyth)

Euprepes macularius Blyth, Journ. Asiatic Soc. Bengal, vol. 22, 1853, p. 652 (type locality, Rangpur, Bengal).

Mabuia macularia Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, pt. 2, 1931, p. 165.

Mabuia macularia (part) Smith, Fauna of British India including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, pp. 264-266.

The collection contains two specimens of this species (U. S. N. M. No. 29410 and 120325) collected by D. L. Karcher, Ceylon, Clodagh Estate, Rattota, Matale District. These differ in certain characters and if the differences are not due to age, may possibly represent two forms.

No. 29410. Part of rostral visible above less than half length of frontonasal which it touches, separating the internasals; latter nearly one third wider than long; prefrontals forming suture; parietals separated by interparietal which is distinctly longer than broad; two supraoculars touch frontal; length of parietal $1\frac{1}{3}$ times in width; parietal partly segmented on left side; a postnasal present; first loreal at least twice as high as long, about half length of posterior loreal; four supraoculars; five superciliaries; three anterior temporals; lower eyelid with quadrangular scales; seven upper labials; mental much shorter than postmental; first pair of chinshields separated; second pair separated by a single scale; third pair (one of the pair segmented longitudinally) separated by three scales; seven (or eight) lower labials; 25 scale rows, the 12 ventrals smooth, the remainder keeled with five, six, or seven keels; temporals practically smooth; scales under base of tail small becoming widened posteriorly both ventrally and dorsally; subdigital lamellae on fourth toe, 13-15. Eight or ten axillary rows of granular scales, forming a pocket; two small granular rows behind leg insertion; no modified scales on posterior surface of thigh; hind leg reaches somewhat beyond wrist of adpressed arm; nearly uniform olive above with a broad lateral brown band bearing numerous streaks or flecks of white.

No. 120325 is a larger adult that differs from the smaller (and younger) in several points: The prefrontals separated, and first supraorbital separated from frontal; series of scales in the axilla somewhat fewer and pocket not well defined; scales on posterior part

of femur show distinct modification in having a small patch of enlarged soft scales near limb insertion.

There is of course the possibility that two separable forms are represented by these two specimens. They agree in the following characters: The first chinshields are separated, and the mental is much narrower than the postmental. The part of the rostral visible above is less than half the length of the frontoparietal. The white spots on the sides are strongly evident. The hind limb reaches half way between wrist and elbow of the adpressed arm.

A larger series of specimens will be necessary to determine the status of the variation.

Mabuya beddomii (Jerdon)

Euprepes beddomii Jerdon, Proc. Asiatic Soc. Bengal, Mar., 1870, p. 73 (type locality, Mysore, India).

Mabuya beddomii Smith, The Fauna of British India including Ceylon and Burma. Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, pp. 274-275 (Punduloya).

A series of four specimens taken 12 mi. N of Trincomalee are referred to this Asiatic species.

The characteristics of these four specimens follow: supranasals broadly in contact; frontonasal very much reduced, much wider than long; prefrontal broadly in contact; six superciliaries; a pair of nuchals; no postnasal; eyelid with three or four enlarged scales; first pair of chinshields separated; dorsal and lateral scales rather weakly keeled, with three or (rarely) five keels; temporal scales smooth; the length of parietal contained in width, $1\frac{1}{3}$ times; height of subocular about one half its length; 30 or 31 scale rows around middle of body.

Dorsal surface brown with a short, whitish, black-edged stripe beginning on nuchals and extending to a line drawn in front of arm insertion; a broad dorsolateral dark stripe to some distance on tail bordered above by a very narrow cream line and below by a broader (two half scale rows wide) white or cream line; this light line bordered below by a dim dark line; lateral cream line, arising on upper lip passes for the most part above, rather than through, ear; venter immaculate white.

These Ceylon specimens differ from the continental Indian specimens in having the middorsal line much reduced. The very young (26 mm.) specimens show the same marking as obtains in the largest (53 mm.). Whether there are likewise stable differences in squamation cannot be determined from the material at hand.

Mabuya floweri sp. nov.

Type. EHT-HMS No. 30507. Collected 12 mi. north Trincomalee, Ceylon, Sept. 3, 1944. E. H. Taylor, collector.

Paratype. No. 30506, same locality and collector.

Diagnosis. A small, terrestrial species; scales for the most part tricarinate having transparent part of eyelid broken into three or four short quadrangular scales; frontal short, equal to or minutely less than its distance from tip of snout, shorter than combined length of interparietal and frontoparietals; no postnasal; supranasals separated; prefrontals and parietals also separated; first chinshields separated; six superciliaries; a well-defined, swollen (glandular?) area on posterior part of thigh, covered with large, irregular, more or less pointed scales; 30 scale rows about body, the 12 ventral scale rows smooth, the 18 dorsal and lateral scale rows heavily keeled.

Description of the type. Rostral folding back over snout, the part visible above less than half length of frontonasal with which it is in contact, thus separating supranasals; latter scales narrow, elongate, separated by a distance equal to one third of their length; frontoparietal nearly one fifth wider than long, forming a suture with frontal and separating large prefrontals; frontal about one fifth longer than frontoparietals; interparietals short, about as wide as long; greatest length of parietals contained in width about one and one fourth times; a well-developed pair of nuchals; second supraocular alone touching frontal, both second and first touching prefrontal; four supraoculars; suture between rostral and first labial when extended upward passes somewhat in front of nostril; nasal definitely a single scale; no postnasal present; anterior loreal distinctly higher and narrower than second; two presuboculars; four postsuboculars diminishing in size, the upper separated from last supraocular by a single scale that is in contact with last superciliary; three primary and three secondary temporals; four supralabials precede and two follow the subocular which is two and one half times longer than high; three bluntly pointed ear lobules; four large rectangular scales on eye; eight or nine infralabials; a large postmental in contact posteriorly with a small median scale separating the first pair of chinshields; second pair separated by a single scale, third pair by three scales; ear opening circular, its diameter less than transparent part of eyelid; scales in 32 rows about body, 12 ventral rows smooth, 18 dorsal and lateral rows strongly tri-

carinate with sometimes an additional outer tubercle or keel on scales from nuchals to base of tail; the keels form nearly continuous lines arranged in groups of three, these groups distinctly separated from the next series of three by a space that is distinctly wider than that between keels of the rows forming the series; dorsolaterally the outer edges of the scales show a tiny tubercular elevation or a fairly well-defined keel; on tail, scales are bi- or tricarinate; nuchals and scales immediately following nuchals have four to six keels; the crease of the axilla with five or six rows of minute granules not forming a "pocket" or at most only a very shallow one; in crease behind insertion of thigh a similar series of five or six rows of granular scales. Scales on arm tricarinate and either bi- or tricarinate on upper surfaces of thigh and tibia; a pair of distinctively enlarged preanals with three other smaller preanals on each side; temporal scales keeled.

Tubercular scales on palm and soles somewhat pyramidal; subdigital lamellae rounded, nearly smooth without keel, 15-16 under fourth toe. Swollen area on posterior part of thighs covered with a series of irregular enlarged scales with narrowed tips that stand nearly erect and are separated from each other; the scales above and below them are regularly imbricating scales. Adpressed hind limb reaches to elbow of adpressed arm.

Color. Above dull olive with metallic reflections; a greenish white dorsolateral line runs from eye to base of tail becoming less distinct as tail is approached; a broad brownish band follows along side from eye to groin; an indistinct line on supralabials becomes distinct behind eye, and gives a whitish border to ear opening and beyond which it may be traced below the brown band to groin. Top of head brownish; two series of about twenty short narrow transverse black marks beginning at shoulder continue back to some distance on tail. Ventral surface light with a slight greenish cast.

Measurements in mm. of the type and paratype respectively. Snout to vent, 56, 55; tail length, 95, (?); length of head to end of interparietal, 10, 9.9; width of head at ear, 9.5, 9.6; snout to ear opening, 11.7, 11; snout to foreleg, 20, 20; axilla to groin, 27, 28; foreleg, 14, 14.5; hind leg, 21, 21.5.

Variation. The paratype agrees with the type in all characters listed except there is less evidence of an outer keel in the smooth space between the series of three keels, and the small dorsal marks are reduced to two dots instead of a single narrow transverse mark. These double series occur from shoulder to some distance on the tail.

Remarks. This species was found in a coconut grove some distance back from the sea beach and was never observed climbing.

The modified scales on the posterior part of the thigh is a character that has not been used by Boulenger or Smith in separating the Asiatic species of *Mabuya* but it is apparently constant in the species in which it occurs*. This condition is reminiscent of a scale modification that occurs on the posterior part of the thighs of certain eastern Asiatic *Eumeces*.

The looseness of these scales allows the ingress of numerous small mites, and both specimens show infestations of these parasites.

Mabuya carinata (Schneider)

Scincus carinatus (part) Schneider, *Historia Amphibiorum*, vol. 2, 1801, p. 183 (type locality unknown).

Mabuya carinata Boulenger, *Catalogue of the Lizards in the British Museum*, 2d ed., vol. 3, 1887, pp. 182-183 (Ceylon); *Fauna of British India including India and Ceylon: Reptilia and Batrachia*, 1890, pp. 188-189, fig. 56 (Ceylon). Willey, *Spolia Zeylanica*, vol. 4, 1907, pp. 186-188. Green, *ibid.*, vol. 5, pt. 18, Apr., 1908, p. 104 (presumed poisonous bite). Deraniyagala, *Ceylon Journ. Sci.*, sec. B, vol. 16, 1931, p. 167.

Mabuya carinata Smith, *The Fauna of British India including Ceylon and Burma; Reptilia and Amphibia*, vol. 2, Sauria, Feb. 7, 1935, pp. 206-207, fig. 68.

Tiliqua rufescens (part) Günther, *The Reptiles of British India*, 1864, pp. 79-80 (Ceylon).

This large species is represented in the collections by U. S. N. M. No. 120325 from Clodagh Estate, Rattota, Matale District, collected by H. G. Deignan; and EHT-HMS Nos. 30504-30505, 30489, 30493 collected 12 mi. N of Trincomalee, Ceylon, by E. H. Taylor. The specimens are typical. This species has a range extending throughout Ceylon, and it is widespread in India and Burma.

The species may be recognized by the following characters: supranasals separate; frontonasal longer than broad; prefrontals separate (elsewhere they may be in contact); a pair of nuchals; no postnasal; anterior loreal higher, but shorter, than second (the two fused in No. 30490); three or four large scales on lower eyelid; postmental usually touches a single median scale, thus separating the first pair of chinshields; dorsal scales subequal, 30 scale rows around body (30-34 reported elsewhere); the temporals keeled; scales keeled with three (young), five or, rarely, seven keels on dorsum and side of adults; ventrals smooth; 15 to 18 smooth lamellae under fourth toe. Reaches a length of 125 mm. snout to vent. Olive above, uniform or with flecks or lines on the scale edges. The dorsolateral light stripe from eye to tail often orange or reddish in males during the breeding season.

* It is possible that the variation is not fully evident in young specimens as suggested under *Mabuya macularia* Blyth (this paper).

Mabuya madarászi Méhely

Mabuia madarászi Méhely, Termes. Füzetek, vol. 20, 1897, pp. 59, 61 (type locality, Kala-Wewa and Madatugama, Ceylon).

Mabuia macularia (part) Smith, The Fauna of British India including Ceylon and Burma, Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, pp. 264-266.

The distinctive modification of the squamation on the posterior part of the thigh of this form caused me to believe at first that the series here reported constituted a new form. However since the specimens agree with the type description of *Mabuya madarászi* in other characters, I suspect that the thigh characters were overlooked by Méhely, as well as others who have seen Méhely's types, or other specimens of this species from Ceylon.

The larger part of the specimens have heavy infestations of a small mite on the back of the thigh that tends to distort the appearance of the area. However when the mites are removed the characters are distinct. Some of the specimens have no such infestations, and the scales are modified in the same manner.

I append a rather detailed description of a specimen to supplement the original type description.

Diagnosis. A medium-sized, arboreal *Mabuya*, five- to seven-keeled; transparent part of eyelid broken up into at least five quadrangular scales; supranasals separated; prefrontals and parietals also separated; five superciliaries; no postnasals; two or three primary temporals; subcaudals not widened; chinshields broadly in contact; an irregular series of scales covering a somewhat swollen area on posterior thigh surface; posterior to insertion of leg, an area of smaller irregular scales, and in the distal end of femoral region another area of smaller scales, the two areas connected by a double or triple series of large, somewhat irregular loosely imbricating scales.

Description of EHT-HMS No. 30566. Portion of rostral visible from above nearly two thirds of length of frontonasal, the two scales forming a suture that separates the narrow elongate internasals; frontonasal distinctly wider than long, touching anterior loreals laterally and frontal posteriorly, thus separating prefrontals; frontal elongate touching only second supraocular, which is also in contact with prefrontal; interparietals a little more than half length of frontal; interparietal definitely longer than wide; nuchals and part of parietals destroyed; nasal small, the part behind nostril greatly reduced; anterior loreal much higher but less than half as wide as posterior loreal; two presuboculars; height of subocular in its length, $2\frac{1}{2}$ times; four supralabials anterior to subocular; four supraoculars;

five superciliaries; four postsuboculars diminishing in size; two primary temporals, three secondary temporals; mental almost equal in length to postmental; first pair of chinshields in contact, second pair separated by one scale, third pair by parts of three scales; eight infralabials; three or four small ear lobules; diameter of circular ear opening half length of subocular; lower eyelid with a semi-transparent area covered by five or more vertically elongated quadrangular scales.

Thirty scale rows around middle of body, the twenty dorsal and lateral rows are seven-keeled (sometimes five in young); a varied number (two to five) of keels on upper side of arm and leg; usually three or more keels present on basal third of tail; scales following nuchals somewhat irregular.

Limbs long, the adpressed hind limb reaching to axilla; lamellae under fingers and toes not or bluntly keeled; 15-15 lamellae under fourth toe; two median preanals distinctly larger than surrounding scales, the three lateral preanals diminishing in size; subcaudals not distinctly widened. Scales on back of thigh strongly modified; a group of small scales behind insertion and another group of smaller scales at distal end of femoral region; the scales between these areas soft, more or less pointed, loosely imbricated, often nearly erect.

Color in life. Upper surface of head coppery brown, the eight dorsal scale rows copper colored with some olive wash and metallic reflections, and with some trace of darker markings in the middle of each scale suggesting indistinct darker lines; an indistinct dorso-lateral light line continues some distance on tail; a broad dark brown band begins behind eye and continues far on tail, laterally occupying two whole rows and parts of two other scale rows. A cream line beginning on upper labials passes below ear, bordering the brown band below and continuing some distance on the tail; ventral surface washed lightly with dull olive.

Measurements in mm. Snout to vent, 72; tail, 99, partly regenerated; width of head at ear, 11.2; length of head to end of interparietal, 12.5; snout to ear, 15; snout to arm insertion, 27.5; axilla to groin, 35.5; arm, 21.5; leg, 35.2.

Variation. As regards the diagnostic scale characters, there is little or no significant variation. The coloration, however, does vary.

No. 30570. This specimen has eight dorsal scale rows and the top of the head is bright copper with metallic reflections. The borders of the brown band above and below were greenish cream in life. Nos. 30505 and 30571 have this identical coloration although they

differ much in size (respectively 72, 63, and 51 mm. in snout-to-vent length). One of the specimens (30568) has the median dark areas in the scales somewhat intensified and there are five narrow dark dorsal lines evident when the specimen is submerged. Scale rows vary between 30 and 32; only one has the latter count, and three have 31. The others have 30 rows.

Two adult female specimens (30569, 30572) differ in having the scales in the nuchal and temporal regions dimly keeled or smooth, and the specialized scales on the posterior part of the thigh are more definitely pointed and soft; the hind legs fail to reach quite to the axilla. One female is strongly infested with small mites in the post-femoral region.

The lamellae under the fourth toe vary between 15 and 18, 16 being most frequent. The number 18 was encountered once, 15 three times. In none of the specimens is there a trace of ocellated spots on the sides of the neck and body.

Remarks. It seems probable that this species has been confused with another or other species of which *macularia* is the most probable. The latter species has been reported and certainly occurs in Ceylon. A Ceylon specimen is fortunately at hand and a description is given.

GENUS RIOPA Gray

Riopa Gray, Ann. Mag. Nat. Hist., vol. 2, Jan., 1939, p. 332.

Genotype. *Lygosoma punctatum*.

Two species occur on Ceylon: *Riopa punctata* and a new form here described, *Riopa singha*.

KEY TO THE SPECIES OF RIOPA IN CEYLON

Scales 24-26 rows, each dorsal and lateral scale with a dark spot. In young spots forming 6 dark lines separated by light lines; tail uniform red; dorsolateral light lines from rostral..... *Riopa punctata*
 Scales in 28 rows; four very narrow dark lines on median scale rows; dorsolateral lines from supraoculars; vertical rows of white spots on neck and scattered white spots on the sides; a dorsolateral line from nuchal..... *Riopa singha*

Riopa punctata (Linne)

Fig. 1

?*Lacerta punctata* Linne, Syst. Nat., 1, p. 369.

Scincus punctatus Gmelin, Hist. Amphib., 1799, p. 197, based on Seba's fig. 2, pl. 12, fig. 6.

Riopa punctata Smith, Fauna of British India including Ceylon and Burma, Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 318-319.

U. S. N. M. No. 29412, "Ceylon"; EHT-HMS Nos. 30174-30181, 12 miles north of Trincomalee, Ceylon; E. H. Taylor, coll.

The series from near Trincomalee on the northwest coast, for the most part, was found in coconut groves near the seashore. Indi-

viduals were secretive and their presence was usually made known by the flash of the bright red tail. This red is present on the tails of all young and half-grown specimens, but tends to become completely obsolete in adult animals.

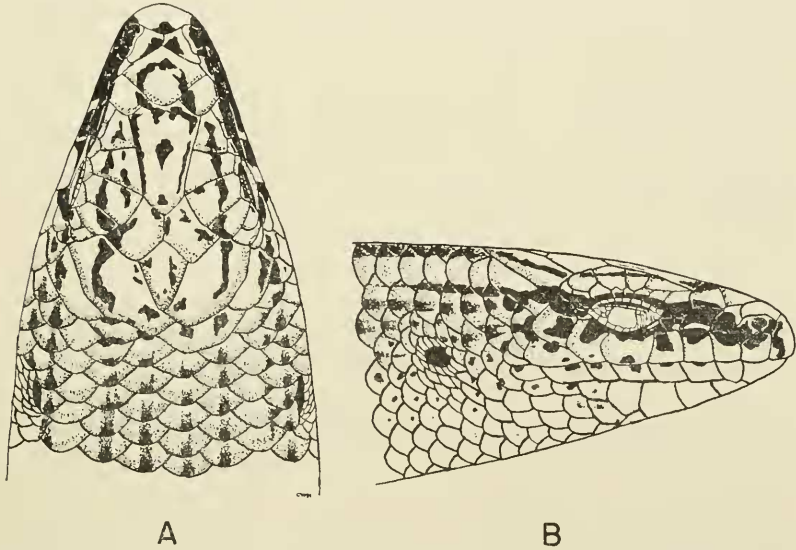


FIG. 1. *Riopa punctata* (Linne). EHT-HMS No. 30178, 12 mi. N Trincomalee, Ceylon. A. Head, dorsal view. B. Head, lateral view. $\times 6$.

The color markings are strongly delineated. Two dorsolateral cream lines begin on the tip of the snout and continue to the tail where they become lost, the intervening dorsal ground color being light olive-tan with six longitudinal series of black spots, one spot on each scale. Seven lateral rows of scales likewise bear black spots. The three upper rows are composed of larger spots and together suggest a dark lateral band or stripe. The ventral scale rows, chin and throat are immaculate. In the young the tail, save in the basal region, is unspotted and of a uniform shade of red. As they grow older, the caudal scales develop small spots (even those on the ventral surface) and gradually the red (sometimes pink) coloration disappears. In the young the black spots are contiguous forming continuous lines. On the head the dots are carried forward to the snout but later tend to form a more or less symmetrical pattern on the head scales.

Scale counts about midbody are 24 to 26; however, when the count is made a little farther forward sometimes 28 may be found. The reason for the variation is that the axillary rows (32 about

body in axilla) tend to drop out quickly but one or two rows on each side may continue back to near midbody. The scales in a row from the nuchal to a point above anus number 68 to 76; the scales under the tail to tip, number 90-91 (2 counts). In all, the prefrontals are separated and the internasals are in contact (barely contiguous in one specimen).

U. S. N. M. No. 29412 is an old faded specimen agreeing with the described series in all pertinent details.

In the figured specimen a small postnasal is evident. This occurs in none of the other specimens, and is absent on the left side in the specimen figured. I regard its presence as anomalous.

Riopa singha, sp. nov.

Fig. 2

Type. U. S. N. M. No. 29411, "Ceylon"; D. L. Karcher, coll.

Diagnosis. A species related to *Riopa albopunctatum*; four very narrow dorsal lines on middle of back; wide dorsolateral cream lines begin at supraoculars; below dorsolateral light line an irregular dark stripe not of solid color, widest at neck and above arm and axillary region tending to form four, fine, broken, dark lines posteriorly. On this dark stripe vertical series of white dots alternating with darker spots, these often somewhat irregular. Scale rows around body, 28; a transparent eye disk present; 70 scales on back between nuchals and a point above vent; snout to arm insertion length contained in axilla to groin length $2\frac{1}{2}$ times; adpressed limbs separated by a distance equal to one and a half to one and two thirds length of arm.

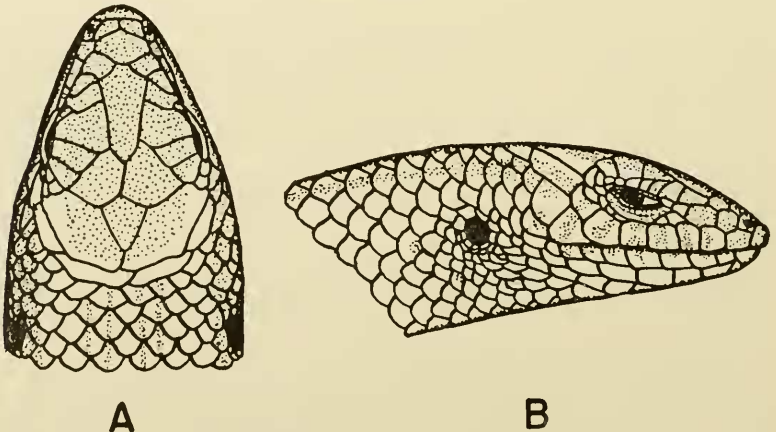


FIG. 2. *Riopa singha* sp. nov. U. S. Nat. Mus. No. 29411, Type.
A. Head, dorsal view. B. Head, lateral view. $\times 5$.

Description of the type. Rostral separated from frontonasal by paired supranasals; frontonasal broader than long, forming suture with frontal; prefrontals rather small, separated; frontal elongate, longer than distance to snout but about two mm. shorter than parietals, interparietal and frontoparietals together; parietals broadly in contact behind interparietal, and bordered by a large temporal and a pair of narrow nuchals; four supraoculars; eight superciliaries; nostril in a small nasal; no postnasal; two loreals, anterior higher than wide, higher but shorter than second which is nearly square; seven upper labials, the suboculars not elongated; two primary temporals, two or three secondaries, upper scales small; the lower secondary separated from ear by four scale rows; seven lower labials; mental followed by a large postmental and this followed by three paired chinshields, first pair in contact, second pair separated by one scale, third pair by five scales; 28 scale rows about middle of body; about 36 rows around body at axilla; 72 scales from parietal to above vent; limbs short, when adpressed, separated by 18 scales; 14 lamellae under fourth toe, strongly keeled; ear opening large, about one third of eye opening; one large and one small auricular lobule; eyelid with a more or less transparent disk; six preanals all somewhat enlarged; tail regenerated; distance from snout to insertion of arm contained in axilla to groin distance $2\frac{1}{2}$ times.

Color. The specimen is of a dirty olive color and probably shows none of the original coloration. A dorsolateral light line two and one half scales wide begins on supraoculars and passes back onto tail; the four median dorsal scale rows with hair-fine brownish lines along their middle; a broad lateral black or brown stripe, tending to form three fine lines posteriorly, and anteriorly with round light spots sometimes forming vertical rows on sides of neck; below uniformly unspotted; limbs with brown spots above.

Measurements in mm. Snout to vent, 44; snout to forelimb, 11.4; axilla to groin, 29; arm, 6.5; leg, 11.

Remarks. The type is in a good state of preservation save that the abdomen has been opened widely, and one limb broken. It is a female as evidenced by several ovarian eggs. The tail shows at least two different regenerations. There is a possibility that this form is the representative of *Riopa albopunctatum* on Ceylon. The points that appear to separate the species are the different body proportion (snout to arm contained in axilla to groin $2\frac{1}{2}$ times, and the limbs separated by a distance equal to one and one half times the

length of the arm) and some differences in color and markings (fine dark lines on four medial scale rows, the wide dorsolateral light line one and one half scale rows wide).

The actual extent of differentiation between the two forms can be determined only with more material from Ceylon and a study of the Indian specimens of *R. albopunctata* with a view of determining geographical trends in squamation.

GENUS DASIA Gray

Dasia Gray, Ann. Mag. Nat. Hist., vol. 2, 1839, p. 331.

Genotype. *Dasia olivacea*.

A single endemic species is known from Ceylon.

Dasia haliana (Haly and Nevill)

Euprepes halianus Haly and Nevill, Taprobanian, vol. 2, 1887, p. 56 (type locality Henaratgoda and Anuradhapura, Ceylon); Boulenger, Fauna British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 213 ("probably belongs to *Lygosoma*"); Haly, Ceylon Adms. Rept., 1893, p. 13.

Theconyz halianus Annandale, Spolia Zeylanica, vol. 3, 1906, p. 191, figs. 1-4.

Lygosoma (Keneuria) halianus Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 15, 1931, p. 174, pl. 37.

Dasia haliana Smith, Fauna British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 278-279.

This arboreal species is known from Central Province, North Central Province, Southern Province, Western Province and Northern Province. It may readily be distinguished from other scincoid species by the following characters: supranasals present; the nostril in a single nasal; the prefrontals, interparietal, and frontoparietal distinct; the ear opening small; large, well-developed clinging limbs; and a yellow-olive color with five or six broad transverse black bands. No specimens are present in the collections.

GENUS SPHENOMORPHUS Fitzinger

Sphenomorphus Fitzinger, Systema Reptilium, 1843, p. 23.

Genotype. *Lygosoma melanopogon*.

Seven species from Ceylon are referred to this genus.

KEY TO THE SPECIES OF SPHENOMORPHUS IN CEYLON

- | | |
|----------------------------------------------------------------------------------------|-------------------------|
| 1. Frontoparietal divided | 2 |
| Frontoparietal single | 6 |
| 2. Less than thirty scale rows about body..... | 3 |
| Forty scale rows about body..... | <i>dussumieri</i> |
| 3. Parietals enclosing interparietal..... | 4 |
| Parietals separated by interparietal..... | <i>megalops</i> |
| 4. Dorsal scales striated..... | <i>deignani</i> |
| Dorsal scales unstriated..... | 5 |
| 5. Adpressed limbs barely overlap, prefrontals forming a common suture... .. | <i>taprobanense</i> |
| Adpressed limbs separated by seven scales; prefrontals usually separated, | <i>striatopunctatus</i> |
| 6. Males with side of head and throat blue-black, each scale with a whitish spot... .. | <i>fallax</i> |
| Males with throat bright rosy red, lacking black color and white spots..... | <i>rufogulus</i> |

Sphenomorphus dussumieri (Duméril and Bibron)

Lygosoma dussumieri Duméril and Bibron, *Érpetologie Générale* . . . vol. 5, 1839, p. 725 (type locality, Malabar, India).

Lygosoma (Sphenomorphus) dussumieri Deraniyagala, *Ceylon Journ. Sci.*, sec. B, vol. 16, 1931, p. 169.

This species has been recorded by Deraniyagala from Peradeniya, Ceylon. It also has a considerable range in southwestern India, and in certain areas it is very common. It may be differentiated from the other species of the genus by the following characters:

The distance between the snout and the forelimb is equal to, or a little less than the axilla-to-groin distance; the prefrontals are broadly in contact; and four or five supraoculars are present. There are 40 scale rows around the middle of the body, the dorsal scales being striated; 20-25 lamellae are present under the fourth toe.

Sphenomorphus megalops (Annandale)

Lygosoma megalops Annandale, *Spolia Zeylanica*, vol. 3, 1906, p. 190 (type locality, Puttalam and Kitulgala, Ceylon); Smith, *Fauna of British India*, etc., *Reptilia and Amphibia*, vol. 2, 1935, p. 289.

The following characters differentiate this species. The types are said to be lost and no other specimens are known to be in collections.

The length from the snout to the forelimb is contained one and one half times in the axilla to groin length. The limbs overlap when adpressed. The eye is large, its diameter as long as the snout. There are no auricular lobules or denticulations on edge of ear. There are no supranasals present, and the parietals are separated by the interparietal. The dorsals and lateral scales are smooth but the ventral scales are feebly keeled. These are arranged in twenty-four to twenty-six scale rows about the body. The color is uniform dark brown. The length of body of the type is two inches and of the tail, two and three eighths inches.

Sphenomorphus deignani, sp. nov.

Fig. 3

Type. U. S. N. M. No. 120326, collected on Mount Ganoruwa (Gangarowa?) Peradeniya, Kandy District, Central Province, Ceylon, by Herbert G. Deignan, 1944.

Diagnosis. A medium-sized, pentadactyl skink, characterized by short limbs, the toes barely overlapping when adpressed; ear-opening large, the tympanum deeply sunk; paired frontoparietals, prefrontals broadly in contact; dorsal scales each with two striae;

nuchals lacking; 24 scales about body; numerous lateral scales with white spots; jaws strongly barred with black.

Description of type. Rostral seen from above little more than half width of frontonasal and forming a rather straight transverse suture with latter; no supranasals; prefrontals large, broadly in contact; frontal a little shorter than combined length of fronto-

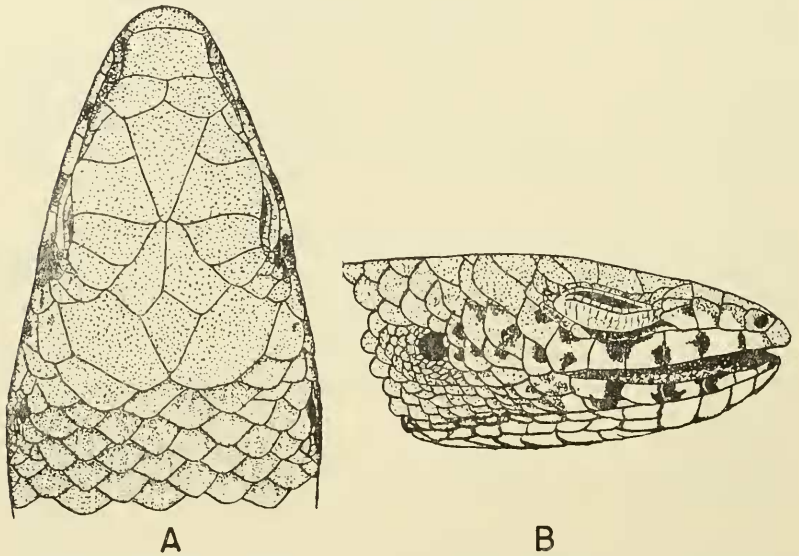


FIG. 3. *Sphenomorphus deignani* sp. nov. U. S. Nat. Mus. No. 120326, Type.
A. Head, dorsal view. B. Head, lateral view. $\times 5$.

parietals and interparietal; four large supraoculars; frontoparietals two; parietals inclosing interparietal; enlarged nuchals lacking; each parietal bordered behind by an enlarged temporal; nine superciliaries; nostril in a single nasal; two loreals of nearly equal size and height; two preoculars, the upper small; suboculars eight or ten, forming a well-defined row along the lower edge of eyelid; eyelid covered with small scales; diameter of eye equal to its distance from nostril; a single primary temporal, not touching the parietal, followed by a pair of secondary temporals, the lower of which is separated from ear by three scale rows; seven upper labials; five lower labials; the mental rather shortened but as wide as rostral, one third as long as postmental; first pair of chinshields in contact; second pair, separated by a scale, touching labials; third pair separated from each other and the labials.

Ear-opening about one fourth of eye diameter, with one or two minute thin lobules on its anterior border.

Twenty-nine scale rows around constricted part of neck; 34 about body behind arm; 28 rows of subequal scales about middle of body; median preanal scales somewhat enlarged; median subcaudals not widened; 48 scales on back from parietals to point above vent. Dorsal and lateral scales with distinct striations, three striae on scales on nape, two striae on most of the other scales; ventral scales smooth; striae present on ventral, lateral, and dorsal scales of tail, but body ventrals have them barely indicated; greater part of tail missing.

Limbs short; the arm reaches forward to eye; hind limb overlaps the adpressed arm by half length of third finger; nineteen to twenty lamellae under fourth toe.

Color and markings. Above dark olive brown, growing light brown on back of body and base of tail; below on chin, abdomen, and under side of tail creamy white; a series of vertical black spots or lines on jaws and on temporal region; sides of base of tail with a few black flecks; heavy black reticulation with whitish spots on arms and legs. Under a lens each scale of back and sides with a crenellated, curved, black spot; together the spots form a complete reticulation, especially evident when epidermis is shed. Many lateral scales have minute, greenish white flecks.

Measurements in mm. Snout to vent, 55; tip of snout to ear, 12; tip of snout to arm insertion, 20; axilla to groin, 28; arm length, 12; leg length, 16.

Comments. The described species may be separated from the other related Ceylonese and Indian species of *Sphenomorphus* as follows: From *megalops* by the smooth instead of the keeled ventrals, seven instead of six upper labials, the presence of striae on the scales, and the different coloration; from *fallax* and *rufogulus* by the paired, rather than single, frontoparietal. From *striatopunctatus* it differs in having the prefrontals broadly in contact instead of widely separated, the limbs touching instead of being separated considerably when limbs are adpressed, toes longer, the lamellae under fourth toe nineteen to twenty instead of ten to twelve, and the markings are different. From *taprobanense*, the present form differs in coloration and markings, heavier and proportionally longer limbs with more numerous scales on feet and palms, and in the presence of striae on the scales. It is a much heavier species. The type of *taprobanense* was said to have six lines of

black dots on the back, the sides of neck and body of a darker brown minutely dotted with white.

The species is named for Dr. Herbert G. Deignan of the U. S. National Museum, who collected the type of the species.

Sphenomorphus taprobanense (Kelaart)

Eumeces taprobanense Kelaart, Prodrum Faunae Zeylanicae, vol. 2, pt. 1, 1854, p. 21 (type locality, Newera Ellia [= Nuwara Eliya], Ceylon); Günther, Reptiles of British India, 1864, p. 89 (part. but not figure).

Lygosoma taprobanense Boulenger, Catalogue of the Lizards of the British Museum, vol. 3, 1887, p. 319; and Fauna British India, Reptilia and Amphibia, 1890, p. 206; Smith, Fauna British India . . ., Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 287-288.

Lygosoma (Sphenomorphus) taprobanensis Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, 1931, p. 120.

This form, of which I have no specimens available, may be distinguished by the following characters: The distance between the end of the snout and the foreleg is contained in axilla to groin distance one and one third to one and three fifths times. The prefrontals are in contact or separated. There are two subequal loreals present. The ear opening is about one half the size of the eye opening. The body scales are smooth, arranged in 24-26 scale rows about the middle. The limbs just meet or narrowly fail to meet when adpressed. The color is brown above with six dark longitudinal lines formed by dots. The upper half of the flank and neck are dark brown, while the color of the lower margin is not well defined. The sides of the neck are with or without white spots. The ventral surface is whitish save that the throat of the adult male is dark blue or purple. The snout-to-vent measurement is 58 mm.

The species is found in the mountainous regions of the central and southern parts of Ceylon.

Sphenomorphus striatopunctatus (Ahl)

Lygosoma punctatolineatum (not of Boulenger, 1893) Boulenger, Spolia Zeylanica, vol. 4, 1907, p. 173 (type locality, Hukgalla, Ceylon).

Lygosoma (Sphenomorphus) punctatolineolatus Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, 1931, p. 169.

Lygosoma striatopunctatum Ahl, Zool. Anz., vol. 6, 1925, 1 and 2, p. 20; Smith, Fauna British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, p. 288.

The species here described agrees with the form *striatopunctatus* in practically all characters save that the prefrontals are moderately large and in contact. The following description is from a Ceylon specimen, No. 120327, in the U. S. National Museum, which, with No. 120326, was collected by Dr. H. G. Deignan, Mount Ganoruwa, Peradeniya, Kandy District, Ceylon.

Distance between end of snout and forelimb (15 mm.) contained in axilla to groin distance (21 mm.) 1.4 times; snout moderately long, oval; rostral convex, broadly in contact with frontonasal,

which is broader than long; prefrontals in contact (said to be rarely separated); frontal as long as frontoparietals and interparietal together; parietals large forming a suture behind interparietal; two frontoparietals; no nuchals; four large supraoculars, the last bordered by two small scales; second largest, first and second touch the frontal; eight or nine superciliaries; a large primary temporal followed by two large secondary temporals, these bordered behind by three smaller scales; seven upper labials, the fifth below eye; presuboculars, suboculars and postsuboculars forming a continuous series of eight or nine scales, all dark colored; two loreals, second largest; nasal single; no postnasal; mental followed by an undivided postmental and two pairs of large chinshields that border labials but only first pair in contact; third pair rather large, separated from labials by an elongate scale; diameter of ear opening about one third that of eye, with one or two projecting lobules; tympanum deeply sunk; body scales smooth; 26 scale rows about middle of body; 53 scales from parietals to above vent; tail somewhat thickened at the base, definitely quadrangular in cross-section; tail partly regenerated, the ventral scales being enlarged on regenerated part (normal scales small); limbs when adpressed separated by about seven scales; thirteen lamellae under the fourth toe; palms and soles with flattened, rather than conical, scales.

The color is as follows (male): Entire head bluish black without white spots, gradually becoming brown on neck; brown on body, with indicated lines (many dorsal scales missing); slightly darker on upper sides, many of the dark scales having a light spot or fleck; lower scale rows on sides dirty white, as are the ventral abdominal scales; tail colored like body, unspotted below.

Snout to vent, 40 mm.; arm, 7 mm.; leg, 11 mm.; axilla to groin, 21 mm.; snout to foreleg, 15 mm.; width of head, 5.6 mm.; head length to back of parietal, 8 mm.

Sphenomorphus fallax Peters

Fig. 4

Lygosoma fallax Peters, Mon. Berlin Akad., 1860, p. 184 (type locality, "Ratnapura, Trincomali" Ceylon); Boulenger, Catalogue of the Lizards of the British Museum (Natural History), vol. 3, 1887, p. 320 (part); Fauna of British India, Reptilia and Batrachia, 1890, p. 206; Méhely, Termes. Füzetek, vol. 20, 1897, p. 61 (Kala Wewa, Ceylon); Smith, Fauna of British India including Ceylon and Burma, Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 288-289.

Lygosoma (Sphenomorphus) fallax Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, 1931, p. 172.

Eumeces taprobanensis (part) Günther, Reptiles of British India, 1864, p. 89 (not figure).

The following specimens are in the collections: U. S. N. M. Nos. 27286, 29413, "Ceylon," and EHT-HMS Nos. 13082-13093, 23 miles west of Trincomalee, Ceylon.

This small species is easily distinguished from *Sphenomorphus striatopunctatus*, *S. taprobanense*, *S. megalops*, *S. dussumieri* and *S. deignani* by having the frontoparietals fused together to form a single scale. It is not entirely easy to distinguish from *S. rufogulus*, a species described herein, that likewise has the frontoparietal single. The males of *fallax* may be distinguished easily since *fallax* has a blue-black head, and cream-white dots on the side of head and throat; and *rufogulus* has a large red area on the throat and no trace of the blue-black coloring on the head. However, females lack these characters and the slight scale differences and the absence of well-defined color patterns make them difficult to distinguish. Twelve miles north of Trincomalee, *rufogulus* was found

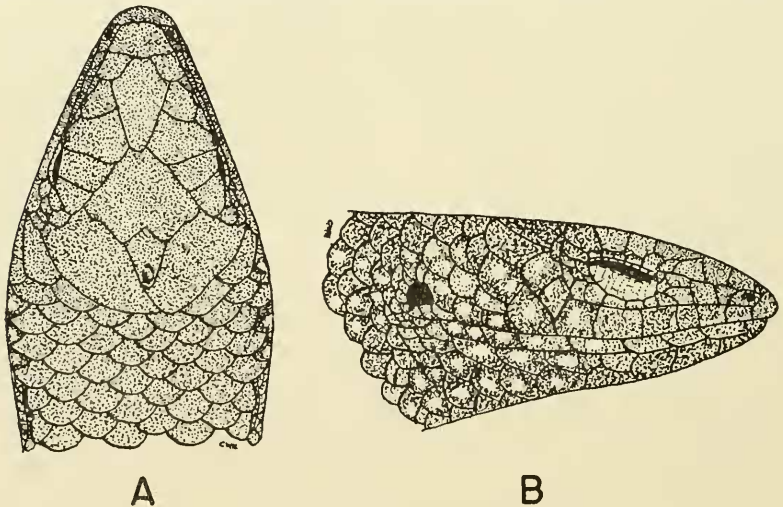


FIG. 4. *Sphenomorphus fallax* (Peters), EHT-HMS No. 13084, 20 mi. W Trincomalee, Ceylon. Male. A. Head, dorsal view. B. Head, lateral view. $\times 5$.

alone and there it was a very common species in the forest near the seashore. Twenty miles from Trincomalee to the west it was found in the forest with *fallax*, the latter apparently in the greater numbers. A very large number of specimens of both species might very readily have been taken had I so desired, as they seemed to be everywhere on the forest floor.

Eight specimens of *S. fallax* have the prefrontals forming sutures of varying width, seven have them separated by variable distances. None have true nuchals, the parietals being bordered by a temporal and five or six body scales. In several specimens the two outer body scales fuse to make a larger scale following the temporal, and re-

MEASUREMENTS AND SCALE COUNTS OF *Sphenomorphus fallax*

| Number | Sex | Snout-vent length | Tail length | Width of head | Snout tip to arm | Axilla to groin | Arm | Leg | Scales about body | Scales to above vent | Lamellae on fourth toe | Anterior temporals |
|--------|-----|-------------------|-------------|---------------|------------------|-----------------|-----|------|-------------------|----------------------|------------------------|--------------------|
| 30194 | ♀ | 41.5 | 53 | 6 | 15 | 22 | 7.2 | 10.5 | 26 | 52 | 15-15 | 2 |
| 30189 | ♂ | 41.5 | .. | 6.4 | 15.5 | 22.4 | 9 | 12 | 26 | 51 | 16-0 | 2 |
| 29413 | ♂ | 41.5 | .. | 7 | 14.8 | 23 | 7 | 11.5 | 26 | 51 | 15-15 | 2 |
| 30184 | ♂ | 41.3 | .. | 6.4 | 14.6 | 22.3 | 8 | 12 | 28 | 52 | 15-16 | 2 |
| 30182 | ♀ | 41 | 57 | 5.9 | 13 | 23 | 7 | 10.5 | 26 | 53 | 15-16 | 1 |
| 30190 | ♀ | 41 | .. | 5.8 | 13.5 | 23 | 8.1 | 11.2 | 26 | 52 | 15-16 | 2 |
| 30192 | ♂ | 40.2 | .. | 6.2 | 15 | 21.5 | 8.2 | 12.3 | 28 | 50 | 15-0 | 2 |
| 30191 | ♂ | 40 | .. | 6.3 | 16 | 23.5 | 8.2 | 12.2 | 26 | 51 | 18-18 | 1-2 |
| 30188 | ♂ | 40 | .. | 6.2 | 13.8 | 21.5 | 8.1 | 12 | 26 | 52 | 15-14 | 2 |
| 30193 | ♂ | 40 | .. | 6.1 | 14.2 | 22.3 | 7.2 | 12 | 26 | 53 | 15-16 | 1 |
| 30186 | ♀ | 39 | 56 | 5.7 | 14 | 22 | 7.5 | 11 | 26 | 52 | 16-17 | 2 |
| 30183 | ♀ | 38 | 57 | 6 | 12 | 21 | 6.5 | 10.2 | 28 | 53 | 15-15 | 2 |
| 27286 | ♂ | 37.5 | .. | 5.8 | 14 | 22 | 7.5 | 11.8 | 26 | 50 | 15-16 | 2 |
| 30185 | ♀ | 37 | 54 | 5.5 | 12.2 | 22 | 6 | 10 | 26 | 51 | 13-15 | 2 |

ducing the number of scales to three or four. The frontal is usually rather small (2.5 mm. in length) while the combined frontoparietal, interparietal and the parietal length measures 4.15 mm. on the median line. The scales of the third pair of chinshields are separated from each other by a single scale and from the labials by a single scale. The presubocular, subocular and postsubocular series are continuous, large, and heavily pigmented like the lateral head scales.

The coloration in the males is deep, almost uniform brown on the ten median dorsal scale rows, with little or no trace of pattern visible under the lens; no dorsolateral lighter line is visible. The three lateral scale rows each show a very slight suggestion of three light lines, often scarcely traceable. The underside of the body is immaculate. The sides of the head, and throat, are bluish black, the color extending to behind the ear opening, each scale with a whitish or bluish white spot more or less clearly defined. The top of the head is variable, dark or lighter brown. The blue-black coloration is missing on head and throat in the females but the lateral whitish lines from axilla to groin are rather clearly distinguishable, the upper being most distinct. A distinct dorsolateral line two half scales wide is present, below which there is a distinct dark band, one whole and two half scale rows wide. Some of the cheek scales and labials may show lighter areas. The sides and ventral part of the tail are more or less heavily flecked with dark brown.

Further data on this series of specimens is given in the following table. Measurements indicate a relatively small amount of size variation other than that dependent on sexual variation. This is evident in the wider head in the males and the somewhat slenderer bodies in the females. None of the males have complete tails.

Sphenomorphus rufogulus sp. nov.

Fig. 5

Type. EHT-HMS No. 30229 collected 12 mi. N of Trincomalee, Ceylon, Sept. 1944, E. H. Taylor, collector.

Paratypes. EHT-HMS Nos. 30195-30228, 12 mi. north of Trincomalee, Ceylon, Sept., 1944; Nos. 30230-30233, 21 mi. east of Trincomalee, Ceylon, Sept., 1944, E. H. Taylor coll.

Diagnosis. A small species of the size of *Sphenomorphus fallax*, and, like it, having the frontoparietals fused, the interparietal and the internasals enclosed by the parietal, two or three primary temporals, but differing in having the throat and chin lacking dark

pigment, and colored bright red in the males. Males with three to five dim ocelli on the last supralabials and temporals. Dorsal coloration lighter brown.

Description of the type. Rostral broad, low, two and one half times as wide as high; frontonasal one and one half times as broad as long; prefrontals large, forming a broad suture; frontal longer than its distance from end of snout, a little shorter than frontoparietal; width of frontal contained in width of supraoculars one and one fourth times; frontoparietal a single scale, its length minutely less than its width; interparietal small, enclosed by large parietals;

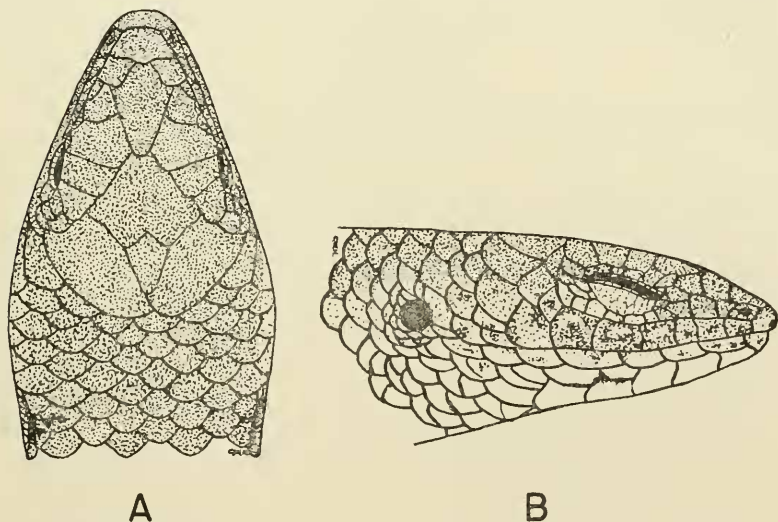


FIG. 5. *Sphenomorphus rufogulus* sp. nov. EHT-HMS No. 30228, Paratype and topotype. A. Head, dorsal view. B. Head, lateral view.

combined length of parietals and frontoparietal exceeds their distance from the snout tip about one eighth; nostril in a single nasal followed by an anterior loreal wider at top, higher but narrower than posterior loreal; a pair of preoculars, the lower larger; seven or eight superciliaries; four supraoculars, two touching frontal; seven supralabials, the fifth below middle of eye; a series of six scales lie between labials and small scales of eyelids; a rather large scale partly between fourth supraocular and parietal; one rather large postocular; three primary temporals, the upper largest; two secondary temporals, the lower separated from ear by two scales; mental more than half as wide as postmental; three pairs of chinshields, first pair in contact, second separated by a scale but touching

MEASUREMENTS AND SCALE COUNTS OF *Sphenomorphus rufoguttus* sp. nov.

| Number | Sex | Length to vent | Tail | Width of head | Snout to arm | Axilla to groin | Arm | Leg | Scale rows | Dorsal scales to above vent | Lamellic under fourth toe | Anterior temporals |
|--------|-----|----------------------|-------|---------------------|--------------------|-----------------------|-----|------|---------------|-----------------------------------|---------------------------------|-----------------------|
| 30228 | ♂ | 42.5 | .. | 6 | 13.3 | 24 | 8 | 12 | 26 | 51 | 17-15 | 1-2 |
| 30212 | ♀ | 42 | regen | 5.5 | 13.5 | 22 | 8 | 10.5 | 26 | .. | 15-16 | 1-2 |
| 30199 | ♀ | 41 | .. | 5.9 | 13 | 23 | 7.8 | 11 | 26 | 53 | 15-18 | 2-1 |
| 30201 | ♀ | 40 | 60.8 | 5.3 | 12.8 | 22 | 7.6 | 10.5 | 26 | 52 | 16-18 | 2-2 |
| 30209 | ♀ | 39 | 61 | 5.3 | 13 | 21 | 7.2 | 10.8 | 26 | 54 | 18-16 | 2-2 |
| 30196 | ♂ | 39 | regen | 6.1 | 14 | 21 | 7.8 | 12.1 | 26 | 53 | 15-17 | 1-2 |
| 30231 | ♂ | 39 | regen | 6.5 | 13.7 | 20 | 7 | 12 | 28 | 50 | 13-13 | 1-1 |
| 30211 | ♀ | 38.5 | 58 | 5.2 | 12.5 | 20.5 | 7 | 11 | 24 | 55 | 16-16 | 1-1 |
| 30220 | ♀ | 38 | 62 | 5.5 | 12 | 22.3 | 7 | 10 | 26 | 50 | .. | 1-2 |

labials; third pair separated by a scale and each separated by a single scale from labials; five elongate infralabials.

Scales smooth, in 28 rows around middle of the body; median caudals not enlarged; 48 scales from parietals to above anus; 40 scales from axilla to groin; 16 lamellae under fourth toe with an indistinct keel or tubercle on each; adpressed hind limb separated from adpressed arm by four or five scales.

Color. Above, light wood-brown, the head not or very slightly darker than back. The dorsolateral line (present in females) is barely indicated on sides of body and neck; on tail represented by black dots on two scale rows; temporal region with some flecks and several small ocellated cream spots on temporals and posterior labials; a bright red area on chin and neck

Measurements in mm. Snout to vent, 41; tail, 41 (tip missing); arm, 8.2; leg, 12.3; axilla to groin, 22.2; snout to arm insertion, 15.3; head width, 6.1; head length, 8.

Remarks. It is entirely probable that this species is identical with the form figured by Günther in his Reptiles of British India, 1864, pl. 13, fig. B, as *Eumeces taprobanensis*. The specimen shows two primary temporals, a rather common condition in *rufogulus* and it is presumed that the frontoparietals are fused. At any rate the figure might serve very well as an illustration of this species, especially for the females. Boulenger (Catalogue, vol. 3, pp. 319-320) however has referred the figure to the true *taprobanense* and some of the other specimens mentioned by Günther to *fallax*.

A table of measurements and scale counts of a part of the paratype series is given.

GENUS CHALCIDOSEPS Boulenger

Chalcidoseps Boulenger, Catalogue of the Lizards in the British Museum, 2d ed., vol. 3, 1887, p. 423.

Genotype. *Chalcidoseps thwaitesi*.

This genus has the nostril pierced in the rostral near the posterior edge. A scale lies above the first labial preceding the loreal; a very large frontonasal is present preceded by a relatively small rostral; no prefrontals or frontoparietals present. The body is elongate, with four small limbs each bearing four digits

Chalcidoseps thwaitesi (Günther)

Nessia thwaitesi Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 9, 1872, p. 86 (type locality, Ceylon).

Chalcidoseps thwaitesi Boulenger, Catalogue of the Lizards of the British Museum, 2d ed., vol. 3, 1887, p. 423, pl. 38, fig. 1; and Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 226, figs.; Dereniyagala, Ceylon Journ. Sci., sec. B, vol 16, (2), 1931, p. 176; Smith, Fauna of British India, etc., Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 335-336, fig. 83.

The genus has but a single species, which may be distinguished from any other known Ceylonese lizard by the generic characters listed above. It is known only from Ceylon specimens having been taken at Gammaduwa, in the Central Province. It is said to live at from 4,000 to 5,200 feet elevation among dead leaves and other vegetation.

GENUS NESSIA Gray

Nessia Gray, Ann. Mag. Nat. Hist., vol 2, 1839, p. 336.

Evesia Gray, Ann. and Mag. Nat. Hist., vol. 2, 1839, p. 336. *Genotype.* *Evesia monodactylus* Gray (type locality unknown; presumably Ceylon.)

Pseudodactylus Fitzinger, Systema Reptilium, 1843, p. 23. *Genotype.* *Evesia bellii* Duméril and Bibron (= *N. monodactyla*).

Tetrapedus Jan, Arch. für Naturg., Berlin, 1860, p. 69. *Genotype.* *Tetrapedus smithii* Jan. from Ceylon.

Acontias (part) Boulenger, Catalogue of the Lizards of the British Museum, vol. 3, 1887, p. 224.

Anguinicephalus Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 18, 1934, p. 232. *Genotype.* *Acontias layardi* Kelaart, from Ceylon.

Genotype. *Nessia burtoni* Gray (type locality unknown; presumably Ceylon).

The group of species considered under this genus are undergoing a variety of evolutionary changes pointing to greater specialization. Usually loss or reduction of limbs, loss of an ear-opening, the presence or absence of toes are regarded as generic characters and such designations have been proposed. However, in the case of *Nessia*, the conformity of the scale patterns of the various species, the great similarity of the distinctive head scales seem to warrant the retention of a single genus for the series of varied forms. It is presumed that the genus has undergone its entire evolution on the Island of Ceylon since it is not known elsewhere. The closest Asiatic relative seems to be *Chalcidoseps*.

The genus *Brachymeles* comprises a group of species comparable to these forms, confined so far as is known to the Philippine Islands. There the genus is represented by some ten known species. They are widely distributed in this archipelago, being absent so far as is known however, in the Calamianes Islands and Palawan. The more generalized, more primitive forms, having typical, well-de-

veloped pentadactyl limbs are still extant. *Brachymeles schadenbergi* typifies this condition.*

One might account in part for the diversity of forms of *Brachymeles* by the archipelagic condition, obtaining at various times in geological history of the Philippines, that has allowed the factor of isolation effective play. No similar archipelagic condition exists now and it is doubtful if it has ever existed so as to play an effective part in the evolution of *Nessia* in Ceylon. One must suppose that the isolated elevated areas have provided "isolation" necessary for their diversification.

KEY TO THE SPECIES OF NESSIA

- | | |
|-------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1. Two or four limbs present; interparietal broader than frontal (except <i>sarasinorum</i>); ear opening present..... | 2 |
| Limbs absent | 6 |
| 2. Limbs bearing clawed digits..... | 3 |
| Limbs budlike, lacking clawed digits..... | 4 |
| 3. Four limbs present, tridactyl; 24 scales at midbody..... | <i>burtonii</i> |
| Four limbs present, didactyl; 24 scales at midbody..... | <i>didactyla</i> |
| 4. Four limbs present; 24-26 scales about midbody..... | <i>monodactyla</i> |
| Two limbs present; scales variable..... | 5 |
| 5. Scale rows about midbody, 28..... | <i>bipes</i> |
| Scale rows about midbody, 22; interparietal narrower than frontal..... | <i>sarasinorum</i> |
| 6. Snout flattened below, projecting sharklike; frontonasal one third width of rostral; ear-opening present..... | <i>hickanala</i> |
| Snout not especially flat; not sharklike; frontonasal more than half length of rostral | 7 |
| 7. One large elongate loreal; preoculars small; frontonasal nearly as long as rostral, | <i>loyardi</i> |
| Two loreals, the posterior lower than anterior; frontonasal a little more than half of rostral length..... | <i>deraniyagalai</i> |

Nessia burtonii Gray

Nessia burtonii Gray, Ann. and Mag. Nat. Hist., vol. 2, 1839, p. 336; Kelaart, Prodromus Faunae Zeylanicae, vol. 2, pt. 1, 1853, pp. 11-12; Günther, Reptiles of British India, 1864, p. 97.

Acontias burtonii Boulenger, Catalogue of the Lizards of the British Museum, vol. 3, 1887, p. 425; and Fauna British India including Ceylon and Burma, Reptilia and Amphibia, 1890, p. 227; Smith, Fauna of British India . . . , Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 357-358.

Acontias (Nessia) burtoni Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, (pt. 2), 1931, p. 177; and *idem*, vol. 18, pt. 2, May 22, 1934, pp. 231-232.

Description. Snout subacuminate, at least twice as long as the orbit, strongly projecting beyond the lower jaw; rostral about two fifths as long as the snout; fronto-nasal longer than the rostral, distinctly narrower in front than behind; frontal longer than the fronto-nasal, mesially notched on each side by the first supraocular; interparietal broader than the frontal; parietals narrow, obliquely placed, in contact behind the interparietal bordered on each side by

* Taylor, in Lizards of the Philippines, 1922, p. 22, speaks of *Brachymeles schadenbergi* as the most specialized. This is *lapsus*; "least specialized" is intended.

an elongated temporal shield; 4 supraoculars, the first two in contact with the frontal; 5 superciliaries, the first much the largest; one long loreal sometimes divided in the middle; a preocular; lower eyelid an opaque disk or partly divided into scales; upper eyelid vestigial; 4 supralabials, the first very long, the second below the eye; mental large with an azygous shield behind it; ear-opening punctiform. Body very elongate; scales smooth, 26 to 28 round the forepart of the body, 24 round the middle, dorsals largest; preanals not or but feebly enlarged; limbs very short, tridactyle, clawed; forelimb originating at about the level of the 20th ventral scale, about as long as four scales, shorter than the hind limb.

Light brown above, the scales tipped or edged with dark brown, the general appearance being almost uniform brown or reddish-brown; paler below.

From snout to vent 75 mm.; tail bluntly pointed, about three quarters the length of the head and body.

Range. Central, Western and Sabaragamuwa Provinces." (from Smith, *loc cit.*)

The species is reported by Kelaart from Ambegammoa and Kaduganava (several smaller specimens).

Nessia didactyla (Deraniyagala)

Acontias (*Nessia*) *didactylus* Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 18, 1934, pp. 232-233 (type locality, Polgehavala).

Nessia didactyla Smith, Fauna of British India including Ceylon and Burma, Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, p. 358.

Description. "Anguiform, with didactyle, clawed limbs. Snout bluntly acuminate, jaws overshot exposing anterior teeth of upper jaw. Lower eyelid scaly, ear small, about 7 scales behind eye which is midway between nostril and ear. Rostral covers about a third of the snout, with the nostril pierced in its anterior region and connected to the posterior margin of rostral by a groove. Frontonasal longer than the rostral, slightly shorter than the frontal which is shorter than the interparietal. The last is contiguous with the second and third supraoculars. Parietals comparatively wide, wider than the supraoculars and contiguous; behind them a row of 4 enlarged nuchals in a single transverse series.

"Supraoculars 4, the first and second form emarginations in the frontal. Supralabials 4, the first equals loreal and is 1.5 times length of rostral, the second is subocular. Mental moderate, contiguous with a single triangular chinshield behind which are three pairs of elongate shields which are separated from each other mesially by a single row of scales. Infralabials three. Body scales di-

rected ventrally, 26 round mid body and about a hundred from axilla to groin, 7 longitudinal pectoral rows. Anterior limb 23 scales behind gape, as long as rostral with two well developed clawed digits and seven scales along its edge exclusive of the digits, posterior limb longer, with 10-13 rows of scales along its edge exclusive of the digits. Preanals feebly enlarged. Caudals subequal. Extremity of the cylindrical tail is feebly compressed dorsally.

"*Colours.* Brown, the dorsal scales outlined in darker, ventrally lighter.

"*Dimensions.* Snout to ear 6.5 mm., gape 5 mm., ear to forelimb 7 mm., snout to cloaca 65 mm., tail 36 mm." (Type description.)

Range. Known only from the type locality, Polgehavala, Ceylon, elev. 241 ft.

Nessia monodactyla (Gray)

Evesia monodactylus Gray, Ann. and Mag. Nat. Hist., vol. 2, 1839, p. 336 (type locality unknown).

Nessia monodactyla Günther, Reptiles of British India, 1864, p. 97.

Acontias monodactylus Boulenger, Catalogue of the Lizards in the British Museum, vol. 3, 1887, p. 425; Fauna of British India including Ceylon and Burma, Reptilia and Amphibia, 1890, p. 228.

Evesia bellii Duméril and Bibron, Érpétologie Générale, vol. 5, 1839, p. 782. (Substitute name for *monodactyla*; same type.)

Tetrapedus smithii Jan, Arch. f. Naturg. Berlin, 1860, p. 69, pl. 2, figs. 4-12 (type locality, Ceylon).

Acontias (Nessia) monodactylus Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, 1931, p. 178.

Nessia monodactyla Smith, Fauna British India including Ceylon and Burma, Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, pp. 358-359.

Three specimens are in the EHT-HMS Collection, Nos. 30057, 30058, 30059. The following are scale counts and measurements:

| | 30056 | 30057 | 30058 |
|---------------------------------------------------|-------|-------|-------|
| Length of head to nuchals..... | 6.3 | 6.1 | 5.8 |
| Width of head | 5.0 | 5.0 | 4.7 |
| Width of body | 5.5 | 5.7 | 4.8 |
| Tail | .. | 46 | 29.8 |
| Length to foreleg..... | 15 | 14.2 | 13.2 |
| Axilla to groin | 65 | 66 | 48 |
| Scales around neck | 24-26 | 26 | 27 |
| Scales on middle of body | 26 | 24 | 24 |
| Scales 1 cm. before anus | 24 | 24 | 24 |
| Ventral scales postmental to the anal scales..... | 118 | 119 | 121 |
| Subcaudals | .. | 85 | 83 |
| Length of head and body..... | 83 | 84 | 62 |
| Length to ear opening | 6.7 | 7 | 6.2 |

Conformation of the head scales agrees in general with the type description. The temporal bordering the parietal is divided save on one side in No. 30056 where it is single. In this same specimen

the parietals do not inclose the interparietal (an obvious anomaly). The pineal eye is strongly evident in No. 30057. A groove or a pit is present at the eyespot.

The anterior part of frontal is shorter in 30057 than in the other two specimens. Six preanals are present. There are about nine scales in a row on outer surface of limb. The loreal is larger than the first labial, and is divided in none. Five supraoculars; five supralabials; four infralabials are present. The area posterior to the anus is swollen, and covered with small scales.

As to the condition of the budlike limbs, those of Nos. 30056 and 30057 are shorter and broader than those in 30058. In the latter, the smallest specimen, the legs are somewhat longer, and taper more toward the tips. This last specimen is from Peradeniya, Ceylon. The other two are from Ceylon, but definite localities are lacking.

Nessia bipes Smith

Nessia (Evesia) smithi Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 18, 1934, p. 232 (type locality, Gammaduva, Central Province, Ceylon).

Nessia bipes nov. nom. for *Nessia (Evesia) smithi* preoccupied, Smith, Fauna British India, including Ceylon and Burma; Reptilia and Amphibia, Vol. 2, Sauria, Feb., 1935, p. 359.

This species has not been adequately described. It is said to agree with *monodactyla* in the squamation of the head. It differs from that species in having a budlike pair of posterior limbs only and in having 28 scales around the body both anteriorly and in the middle.

From snout to vent 80 mm. Known only from the type specimen, from Gammaduva, Central Province.

Nessia layardi (Kelaart)

Fig. 6

Acontias layardi Kelaart, Prodrum Faunae Zeylanicae, vol. 2, 1853, pp. 12-13 (type locality, "soil of Cinnamon Gardens of Colombo, Ceylon"); and Ann. and Mag. Nat. History, (2), 13, 1854, p. 26; Boulenger, Catalogue of the Lizards in the British Museum Natural History, 2d ed., vol. 3, 1887, p. 426, and Fauna British India including Ceylon and Burma; Reptilia and Amphibia, 1890, p. 228, fig. p. 227; Günther, Reptiles of British India, 1864, p. 96.

Acontias (Nessia) layardi Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, 1931, p. 179, pl. XXXVIII.

Acontias (Anguinecephalus) layardi Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 18, 1934, p. 231.

Nessia layardi Smith, Fauna of British India, including Ceylon and Burma . . . , Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, p. 359, fig. 4, p. 356.

Differs from *burtonii* in the following particulars: Frontonasal broader and shorter than the frontal; three supraoculars, the first only in contact with the frontal notching its lateral margin; first superciliary larger, entering supraorbital region; a pair of nuchals often present; no ear-opening; 24-26 scales around the fore part of

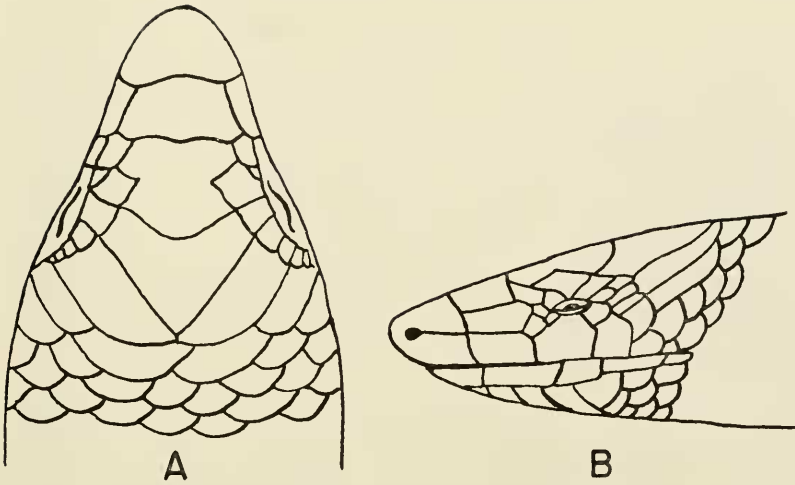


FIG. 6. *Nessia layardi* (Kelaart). Figure from Boulenger, Fauna of British India . . . , 1890, fig. 63, redrawn. Much enlarged.

the body, 22 or 24 round the middle; no limbs. On each side of the vent, in a depression of the body and more or less hidden by scales, a minute horny tubercle can be discovered with a good glass; it represents what is left of the hind limb.

A single specimen of *Nessia layardi*, U.K.M.N.H. No. 24135, was collected at Dambulla in the northern part of Central Province by Dr. W. C. Osman Hill.

The specimen, when compared to Boulenger's figure (Fauna of British India . . . , 1890, pp. 356-358, fig. 84) shows no differences of significance. However the interparietal is slightly less angular (more curved) than the figure and the first lower labial is shorter.

There are 120 scale rows (transverse) and 24 (anteriorly) to 22 (middle and posteriorly) scale rows. The total length of the eye is less than half the length of the loreal. The small nuchals are present; no ear opening. Three supraoculars are present.

There is a slight depression on each side of the body near the vent, covered with small irregular scales marking the point where the limb formerly stood.

The range of the form is Central Province and Western Province although the type locality in the latter province has been questioned by Deraniyagala (*loc. cit.*).

Nessia sarasinorum (F. Müller)

Fig. 7

Acontias sarasinorum F. Müller, Verh. Nat. Gesel. Basel, vol. 8, 1889, p. 702, pl. X (type locality, Inamalua, Ceylon); Boulenger, Fauna British India, including Ceylon and Burma; Reptilia and Amphibia, London, 1890, p. 228.

Acontias (*Nessia*) *Sarasinorum* Deraniyagala, Ceylon Journ. Sci., sec. B, vol. 16, part 2, 1931, p. 178.

Nessia sarasinorum Smith, Fauna British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, p. 360.

A specimen of this rare species, EHT-HMS No. 30003, was taken from under a log, near a small forest stream 21 mi. west of Trincomalee, Ceylon. Its movements were rather slow as it crawled in a burrow in the sandy earth.

The color was dull lavender to grayish lavender in life. Preserved it is lead color, the head, between rostral and nuchals being dark lead. The tail is regenerated, with a ventral light spot, and a dim, incomplete lighter ring on scales preceding the beginning of the regenerated part. The dorsal scales when closely examined show darker areas. There is no external trace of the front limbs, but the scale irregularities show the point where limbs were present in ancestral forms. The hind limbs are budlike, covered by four rows of scales.

There are twelve scale rows about tail, 1 cm. behind anus; 24 rows about neck; 22 about the middle of the body; 127 scales in a row from postmental to anal; 124 scales on back from parietals to level of hind limbs.

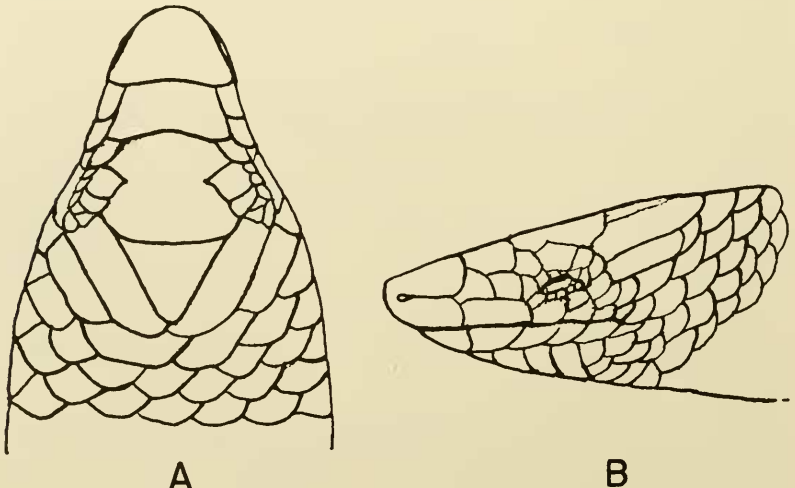


FIG. 7. *Nessia sarasinorum* (Müller). EHT-HMS No. 30003, 21 mi. w Trincomalee, Ceylon. A. Head, dorsal view. B. Head, lateral view. About $\times 10$.

The details of the head squamation follow: Snout extending beyond mouth, covered by a thickened shield much broader than long; nostril pierced in the anterior lateral part with a suture extending back to anterior loreal; frontonasal much broader than long, broader but shorter than the frontal; latter broadly hourglass-shaped; interparietal small, triangular, narrower and shorter than frontal; parietals widened anteriorly, enclosing the interparietal; each interparietal bordered by two elongate scales, the medial of which may be regarded as nuchals; two large loreal scales of equal height; four supraoculars; a large postocular, one preocular; four superciliaries, very irregular in size; four or three suboculars (the first may be excluded from orbit). Scales of eyelids more or less fused together; four supralabials, the first equal in size to the combined loreals; four infralabials; mental thickened, followed by an azygous postmental, wider than the mental; three well-defined pairs of chinshields, the two anterior separated by a single scale; ear opening present, minute.

Snout to vent, 86 mm.; tail (regenerated), 37 mm.; diameter of head, 5 mm.; diameter of body, 5.5 mm.; snout to ear, 7 mm.

Smith (*loc. cit.*) calls attention to errors in Müller's description.

Nessia hickanala Deraniyagala

Nessia hickanala Deraniyagala, Proc. Linnean Soc. of London, 1939-40, pt. 1, Feb. 9, 1940, pp. 37-39, figs. a-d.

Description. Habit anguiform, apodal, with a few small scales indicating the position of the hind limbs. Snout very shark-like, being convex dorsally, but strongly flattened ventrally with a prominent labial ridge; jaws overshot, but front teeth not exposed. Eye small, its lower lid covered by three transparent scales; ear small, about six or seven scales behind eye which is slightly closer to nostril than to ear. Rostral covers about three fifths of the snout, with the nostril pierced in its anterior region and connected to the posterior margin of this shield by a groove.

Frontonasal only about a third of the length of the rostral, and about half the length of the frontal, which is shorter and narrower than the interparietal. Parietals as wide as supraoculars and contiguous behind the interparietal; behind them a single transverse row of four enlarged occipitals. Supraoculars three, one large postocular. Preocular strongly enlarged, cuneiform. Supralabials four, the second is below orbit; mental moderate, contiguous with a single triangular chinshield, and with four enlarged shields along each mandible below the four infralabials, of which the last is conspicuously elongated. Body-scales directed ventrally; dorsals fee-

bly enlarged, 20-21 scales round midbody. Preanals conspicuously enlarged; caudals subequal.

Color. Pinkish-brown, darker dorsally, each scale-pocket a dark brown which becomes reduced with age. After death the pink is replaced by a pale grey.

Measurements (of largest specimen). Snout to vent, 92 mm.; around body in middle, 17 mm. (Of type: Snout to vent, 68 mm.; snout to ear, 7 mm.) The tails of all known specimens were either mutilated or regenerated.

The above description is taken almost wholly from the type description.

Nessia deraniyagalai, sp. nov.

Fig. 8

Type. EHT-HMS No. 30059 ♂, collected 16 mi. N Trincomalee near shore, on small hillock at an elevation of about ten meters, Oct. 24, 1944, E. H. Taylor, collector.

Diagnosis. A legless *Nessia*, differing from the legless *N. layardi* in having two, instead of one loreal, the anterior much the higher; a frontoparietal much broader than frontal but only five eighths as long; part of frontal anterior to lateral notch of much larger area than part posterior to notch; frontoparietal wider than frontal; second supralabial not higher than the much enlarged first. Scale

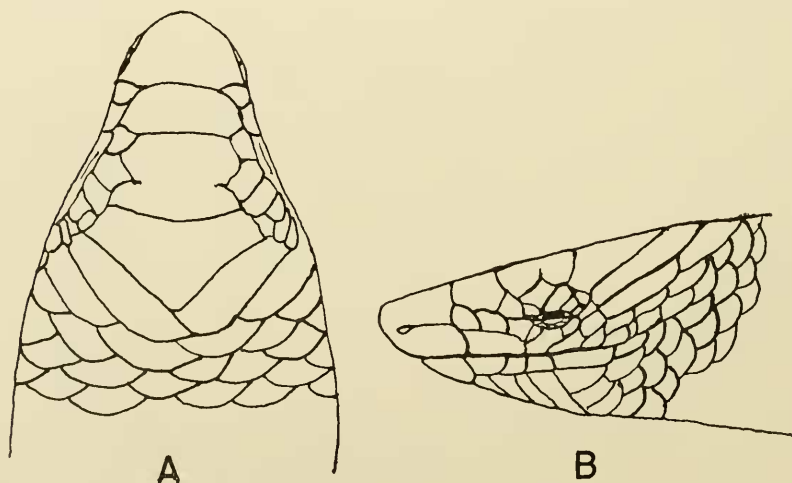


FIG. 8. *Nessia deraniyagalai* sp. nov. EHT-HMS No. 30059. 16 mi. N Trincomalee, Ceylon. Type. A. Head, dorsal view. B. Head, lateral view. $\times 10$.

rows about body: anteriorly, 22, not extending to midbody, where there are 20; 18, one cm. in front of tail.

Description of species. Snout covered with a much thickened rostral plate, more than one and one half times as wide as long; nostril pierced laterally, with a long suture from it passing back to the first loreal; posterior lateral border of rostral somewhat emarginate; frontonasal as wide as rostral, but somewhat shorter; wider than frontal, but latter one and one half times as long; frontal narrowed medially with short lateral sutures, the anterior part of greater width and area than posterior part; frontoparietal wider than frontal, angular posteriorly, convex anteriorly; parietals narrowed somewhat anteriorly, in contact posteriorly, bordered behind by a pair of nuchals and an elongate temporal; two loreals, anterior higher; five supraoculars (the anterior of which may actually represent a greatly enlarged superciliary), (?) three or four superciliaries; five supralabials, first large, elongate, second borders orbit, separated from eye by two minute scale rows on lower eyelid; a preocular; a small presubocular and a postsubocular, the latter above third labial; four infralabials, the posterior elongated; mental thickened, extending back almost as far as the rostral seen from below, and distinctly longer than portion of rostral extending beyond the mouth; postmental narrower and shorter, the posterior edge rounded somewhat; three pairs of chinshields, the second widest, the two anterior separated by a single median scale. Lower eyelid movable, the eye slit two thirds millimeter in length; no ear opening (however in the normal ear position there is a slight lateral depression with one or two minute scales); limbs absent but usual position marked by an irregularity in a single scale on each side; 22 scales on neck; 22 on anterior part of body; 20 at exact midbody; reduced to 18 a centimeter anterior to anus; no hind limbs, the position marked by some irregularities in the scales but no tubercle or remnant of the limb can be discerned; 121 scale rows on dorsum from nuchal to above anus; 125 from postmental to anal shield; 95 ventral scales from anus to tip of tail (complete).

Color. Ground color brownish fawn, each scale with a semilunar spot of dark brown on its extreme anterior part and thus covered by the preceding scale, the spots not or but rarely contiguous; spots forming longitudinal rows as well as diagonal rows. An indefinite blackish brown area above eye, continued down across the preocular.

Measurements. Total length, 130 mm.; snout to vent, 80 mm.; tail, 50 mm.; width of head (greatest), 4.15 mm.; length of head to posterior edge of parietals, 5.6 mm.; width of body, 5 mm.

Remarks. At least two species occur in the flat northern lowlands. These are *Nessia sarasinorum* and the present species. The character of the head scales (especially in regard to the loreals) differs in numerous regards from *Nessia layardi* with which it agrees in absence of limbs and ear-opening.

The species is named for Mr. P. E. P. Deraniyagala, noted Ceylonese herpetologist, and Director of Museums, Ceylon.